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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,911	11/16/2001	Mark A. Horowitz	RB1-011US	6963
29150	7590	03/30/2005	EXAMINER	
LEE & HAYES, PLLC 421 W. RIVERSIDE AVE, STE 500 SPOKANE, WA 99201			LUGO, DAVID B	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/992,911

Applicant(s)

HOROWITZ ET AL.

Examiner

David B. Lugo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-36 and 47-49 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-10, 13, 37, 39 and 41-43 is/are rejected.
- 7) ☒ Claim(s) 7, 11, 12, 14-28, 38, 40 and 44-46 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/16/01, 2/26/02</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claims 14-28 and 44-46 are objected to because of the following informalities:
  - a. In claim 14, line 6, the phrase “a first weighting corresponding to state” is unclear and should be corrected.
  - b. In claim 14, lines 10-11, the phrase “a second weighting corresponding to state” is unclear and should be corrected.
  - c. Claims 15-28 are objected to based on their dependency from claim 14.
  - d. In claim 44, lines 6-7, the phrase “a first weighting corresponding to state” is unclear and should be corrected.
  - e. In claim 44, line 12, the phrase “a second weighting corresponding to state” is unclear and should be corrected.
  - f. Claims 45 and 46 are objected to based on their dependency from claim 44.Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Temple et al. U.S. Patent 5,142,167 (disclosed by applicant).
4. Regarding claim 1, Temple et al. disclose a system in Fig. 2 for transmitting data on a multi-conductor signal path where a change in current flow between successive data transitions is reduced by encoding sets of bits to produce sets of symbols, where data is encoded using a 3/6 code to produce a current with a constant current supply (col. 3, lines 14-26), as six symbols are transmitted on the signal lines connected to I/O devices 2-24 for each group of three bits.
5. Regarding claim 2, the set of six symbols represent more than three bits.
6. Regarding claim 3, the data received on the signal lines is decoded in decoder 70.
7. Claims 6 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Dorros U.S. Patent 3,369,229.
8. Regarding claim 6, Dorros discloses a multilevel transmission system where it is determined if a current level of a transmission signal is within predetermined range (i.e. non-negative), and if the current not within the range (i.e. the current is negative), the signal is coded using code set + so that the current will be within the range (non-negative) in accordance with Table 1 (col. 4, lines 9-12).
9. Regarding claim 8, Dorros discloses that the encoded data is transmitted (see Figs. 3-4).
10. Claims 37, 39, 41 and 43 are rejected under 35 U.S.C. 102(e) as being anticipated by Mansur U.S. Patent 6,226,330.
11. Regarding claim 37, Mansur discloses an apparatus in Figure 7 comprising a plurality of multi-level output drivers 20 coupled to a plurality of conductors for encoding data to maintain

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signal current at a predetermined value (col. 4, lines 7-14), where the voltage levels on each line can assume different levels as shown in Table 4 (col. 10, lines 2-4).

12. Regarding claim 39, the plurality of conductors forms a transmission channel (Fig. 5):

13. Regarding claim 41, the encoded data is transmitted across the conductors (col. 3, lines 20-26).

14. Regarding claim 43, a decoder is coupled to the encoder for decoding the signal received from the multi-level output drivers (see Fig. 10).

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1, 3-5, 37, 39 and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Franaszek U.S. Patent 3,587,088 in view of Perino et al. U.S. Patent 6,005,895.

17. Regarding claim 1, Franaszek discloses a transmission system where change in current flow is reduced between successive data transmissions by encoding data values representing bits to corresponding sets of symbols, as shown in Table 2 (col. 6), where each of symbols are selected such as to produce a current flow within a predetermined set of values (col. 6, lines 66-75), and the symbols are transmitted over a signal path (Figs. 16-17).

18. Franaszek does not expressly disclose that the signal path comprises a multi-conductor signal path.

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19. Perino et al. disclose multilevel signaling over a multi-conductor signal path (see Fig. 4).

20. It would have been obvious to one of ordinary skill in the art to use a multi-conductor signal path as taught by Perino et al. where a conductor is used to transmit each symbol in the system of Franaszek in order to increase transmission throughput by transmitting multiple symbols at a time.

21. Regarding claim 3, Franaszek further discloses that the received signals are decoded in a receiver as shown in Fig. 25 (col. 9, lines 9-12).

22. Regarding claim 4, each symbol supports four different symbol levels (col. 6, lines 65-66).

23. Regarding claim 5, Franaszek discloses that two symbols are used to represent three bits, but does not disclose that each symbol represents two bits. However, the number of bits represented by each symbol is considered a design choice that fails to patentably distinguish over the prior art of Franaszek in combination with Perino et al.

24. Regarding claim 37, Franaszek discloses a transmission system where change in current flow is reduced between successive data transmissions by encoding data values representing bits to corresponding sets of symbols, as shown in Table 2 (col. 6), where each of symbols are selected such as to produce a current flow within a predetermined set of values (col. 6, lines 66-75), and the symbols are transmitted over a signal path (Figs. 16-17).

25. Franaszek does not expressly disclose a plurality of multi-level output drivers coupled a plurality of conductors.

26. Perino et al. disclose multilevel signaling over plurality of conductors using a plurality of multi-level drivers (see Fig. 4).

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27. It would have been obvious to one of ordinary skill in the art to use a multi-conductor signal path as taught by Perino et al. where a conductor is used to transmit each symbol in the system of Franaszek in order to increase transmission throughput by transmitting multiple symbols at a time.

28. Regarding claim 39, the plurality of conductors in the combination of Franaszek with Perino et al. is considered to form a transmission channel.

29. Regarding claim 41, the encoded data in the combination of Franaszek with Perino et al. is transmitted across the conductors.

30. Regarding claim 42, Perino et al. disclose the use of current mode drivers (col. 1, lines 61-63).

31. Regarding claim 43, Franaszek further discloses a decoding circuit for decoding the received signals in Fig. 25, where in the proposed combination of Franaszek with Perino et al., the decoder would receive signals from the plurality of multi-level output drivers.

32. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dorros.

33. Regarding claim 10, Dorros discloses a multilevel transmission system as disclosed above where a data element comprises four bits, but does not expressly disclose that the data element is a byte of data.

34. However, the use of a byte of data (i.e. eight bits) in the system of Dorros is considered a design choice that fails to patentably distinguish over the prior art of Dorros. Thus, it would have been obvious to one of ordinary skill in the art to implement a byte of data as the data element in the system of Dorros as a matter of design choice.

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35. Regarding claim 13, Dorros discloses a multilevel transmission system as disclosed above, where the method is performed using logic gates (i.e. hardware), but does not expressly disclose that the method may be executed on a computer readable media storing computer-executable instructions. However, it is well known in the art to use instructions stored in memory to perform encoding functions in a communication system as software and hardware implementations are well-recognized art equivalents. Therefore, it would have been obvious to one of ordinary skill in the art to implement the system of Dorros using computer instructions stored in memory because it is a well-recognized art equivalent to a hardware implementation.

36. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dorros in view of Perino et al.

37. Regarding claim 9, Dorros discloses a multilevel transmission system as disclosed above, where multi-level signaling is used and the number of multi-levels is four, but does not expressly disclose that the data is transmitted across several conductors each supporting four signal levels.

38. Perino et al. disclose multilevel signaling over a multi-conductor signal path (see Fig. 4).

39. It would have been obvious to one of ordinary skill in the art to use a multi-conductor signal path as taught by Perino et al. where a conductor is used to transmit each symbol in the system of Dorros in order to increase transmission throughput by transmitting multiple symbols at a time.

***Allowable Subject Matter***

40. Claims 29-36 and 47-49 are allowed.

41. Claims 14-28 and 44-46 would be allowable if rewritten or amended to overcome the objections set forth in this Office action.



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42. Claims 7, 11, 12, 38 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Lugo whose telephone number is 571-272-3043. The examiner can normally be reached on M-F; 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Lugo  
3/21/05

  
**KHAI TRAN**  
**PRIMARY EXAMINER**